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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/092,300	03/07/2002	Ho-Jin Kweon	1567.1027	2618

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EXAMINER

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/092,300

Applicant(s)

KWEON ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 10-24 and 32-39 is/are pending in the application.
4a) Of the above claim(s) 15-23, 32, 34 and 35 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-6, 10-14, 24, 33 and 36-39 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 07 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This office action is in reply to the amendment filed 04/21/04. The applicant has overcome the objection. Refer to the abovementioned amendment for specific details on applicant's rebuttal arguments. However, the claims (including newly added claims 36-39) are finally rejected over art as seen below and for the reasons of record:

Election/Restrictions

1. This application contains claims 15-23, 32 and 34-35 drawn to an invention nonelected with traverse in the reply filed on 12/05/03. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Specification

2. The amendment filed 04/21/04 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: (claim 36-37) the specific language stating the negative recitation that "*the at least one additive compound does not include lithium*"; (claim 39) the specific language stating the negative recitation that "*the positive active material is not coated with a coating including the at least one additive compound*". In this regard, it is noted that these language is unsupported by the original specification because the specification does not provide sufficient support for setting forth the specific negative limitations, that is to say, nowhere in the

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specification the examiner has found support to constructively sustain that lithium is not included or the additive compound is not coated as a coating. Thus, the foregoing language is not supported by the initial disclosure filed on 03/07/02.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 36-37 and 39 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The added material which is not supported by the original disclosure is as follows: (claim 36-37) the specific language stating the negative recitation that “*the at least one additive compound does not include lithium*”; (claim 39) the specific language stating the negative recitation that “*the positive active material is not coated with a coating including the at least one additive compound*”. In this regard, it is noted that these language is unsupported by the original specification because the specification does not provide sufficient support for setting forth the specific negative limitations, that is to say, nowhere in the specification the examiner has found support to constructively sustain that lithium is not included or the additive compound is not coated as a coating. Thus, the foregoing language is not supported by the initial disclosure

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filed on 03/07/02. Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Objections

5. Claim 38 recites the limitation "the positive active material powder" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-6, 10-14, 24, 33 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Amatucci et al 5705291.

The present claims are drawn to a positive active material composition wherein the disclosed inventive concept comprises the specific additive compound.

In reference to claims 1 and 10:

Amatucci et al disclose a positive electrode comprising a lithiated composition particulate comprising the positive electrode which have been coated with a passivating layer of a composition comprising a borate, lithiated borate, aluminate, lithiated aluminate, silicate, lithiated silicate or mixture thereof (ABSTRACT). It is also disclosed that the lithiated intercalation compound is coated with coating compositions comprising boron oxide, boric acid,

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lithium hydroxide, aluminum oxide, lithium aluminate, lithium metaborate, silicon dioxide, lithium silicate or mixtures thereof (CLAIMS 1 and 6/ COL 2, lines 5-25). *It is noted that such coating compositions represent additive compounds, that is, compounds added to, included to or incorporated into the positive active material.*

6. A rechargeable battery cell comprising a negative
25 electrode, a positive electrode, and an intermediate nonaqueous electrolyte characterized in that said positive electrode comprises a particulate lithium intercalation compound the particles of which are coated with a passivating layer comprising an annealed coating composition comprising
30 boron oxide, boric acid, lithium hydroxide, aluminum oxide, lithium aluminate, lithium metaborate, silicon dioxide, lithium silicate, or mixtures thereof.

5 These objects, among others, have been achieved in the present invention by means of a novel lithium intercalation cell in which the surfaces of aggregate lithiated intercalation composition particulates comprising the positive cell electrode have been passivated by coating or encapsulation in a
10 layer of a composition comprising a borate, lithiated borate, aluminate, lithiated aluminate, silicate, or lithiated silicate. Such a coating not only reduces the surface area, and thus the degree of activity, of the potentially catalytic particulate aggregates, but also provides a barrier layer which, while
15 limiting contact between the electrolyte and the positive electrode particulates, does not seriously deter the passage of Li^+ ions.

In a preferred embodiment of the present invention, the surfaces of these particulates are coated with a layer of a
20 composition comprising boron oxide, boric acid, lithium hydroxide, aluminum oxide, lithium aluminate, lithium metaborate, silicon dioxide, lithium silicate, or mixtures thereof. In another embodiment of the present invention, the

In reference to claims 2 and 11:

Amatucci et al teach the use of LiCoO_2 , LiNiO_2 and $\text{Li}_{1+x}\text{Mn}_2\text{O}_4$ (COL 1, line 38-42).

EXAMPLES 1-3 illustrates the specific use of LiMn_2O_4 (EXAMPLES 1-3).

In reference to claims 3 and 10:

Amatucci et al shows with *sufficient specificity* the use of H_3BO_3 and/or B_2O_3 compounds among others. Amatucci et al also disclose the use of composition comprising a borate, lithiated borate, aluminate, lithiated aluminate, silicate, lithiated silicate or mixture thereof

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(ABSTRACT). It is also disclosed that the lithiated intercalation compound is coated with coating compositions comprising boron oxide, boric acid, lithium hydroxide, aluminum oxide, lithium aluminate, lithium metaborate, silicon dioxide, lithium silicate or mixtures thereof (CLAIMS 1 and 6/ COL 2, lines 5-25).

In this respect, it is noted that EXAMPLE 3 shows the use of B_2O_3 and $LiOH \cdot H_2O$ to obtain a fine lithiated powder (EXAMPLE 3 or COL 5, lines 25-45). Thus, it is contended that a secondary product of such mixture combination of B_2O_3 and $LiOH \cdot H_2O$ can be a hydroxide of boron.

In reference to claims 4, 12, 24 and 33:

It is disclosed that such additive compound can be added in an amount ranging from 0.4 to 1.0 % by weight (EXAMPLES 1-3). In particular, **EXAMPLE 3** shows the addition of 0.4 % of the borate powder (EXAMPLE 3).

In reference to claims 5 and 13:

As to the method limitation, i.e. *the additive compound being prepared by the specific drying and temperature treatment (heat treatment)*, it is noted that a method limitation incorporated into a product claim does not patentable distinguish the product because what is given patentably consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.

Moreover, Amatucci et al disclose the process of annealing the material at a temperature in the excess of about 400 °C, preferably in the range of about 500-800 °C (COL 2, lines 19-29). Hence, it is contended that at these temperatures, the drying of liquid necessarily occurs unless

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the liquid has an evaporation point higher than 800 °C. Nevertheless, the claim language is silent as to the specific chemical composition of the liquid subjected to the drying step.

In reference to claims 6 and 14:

It is disclosed that the coating composition has either a glassy or crystalline form (COL 4, lines 13-17); in particular, the borate is amorphous (EXAMPLE 1).

As to claim 38:

It is disclosed that positive electrode composition is associated with a current collector member all together (COL 2, lines 60-67).

Hence, the applied prior art anticipates the present claims.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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10. Claims 36-37 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amatucci et al 5705291 as applied to claims 1 and 6 above, and further in view of Kweon et al 2004/0018429.

Amatucci et al'291 are applied, argued and incorporated herein for the reasons above. However, the preceding reference does not specifically disclose the additive compound not including lithium and not coating with the additive compound.

Kweon et al disclose a positive active material for lithium battery wherein the active material also contains aluminum oxyhydroxide or aluminum hydroxide which is not coated thereto (SECTION 0139).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific additive compound not including lithium and not coating with the additive compound of Kweon et al in the positive active material of Amatucci et al as Kweon et al teach that by using such additive the positive active material exhibits better thermal stability, that is, it helps to improve thermal stability.

11. Claims 36-37 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amatucci et al 5705291 as applied to claims 1 and 6 above, and further in view of Bauerlein 2002/0039682.

Amatucci et al'291 are applied, argued and incorporated herein for the reasons above. However, the preceding reference does not specifically disclose the additive compound not including lithium and not coating with the additive compound.

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Bauerlein divulges a positive electrode additionally containing an aluminum compound such as aluminum hydroxide (ABSTRACT); it is also disclosed that additives of hydroxides such as calcium, yttrium, indium, antimony, barium or beryllium can be used (SECTION 0010); as well as hydroxides from the group of lanthanoids (SECTION 0011). *Thus, lithium is not included as the additive compound as well as no coating based on the additive compound is used thereon.*

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific additive compound not including lithium and not coating with the additive compound of Bauerlein in the positive active material of Amatucci et al as Bauerlein teaches that such additive provides a positive electrode which absorbs a large amount of charge at increased temperatures, and has a high capacity at increased charging temperatures as wells.

Response to Arguments

12. Applicant's arguments filed 04/21/04 have been fully considered but they are not persuasive. The main contention of applicants' arguments is premised on the assertion that the prior art does not suggest using either an oxyhydroxide, an oxycarbonate or a hydroxycarbonate. In this respect, it is pointed out that in addition to the foregoing compounds the present claims as part of a Markush group recitation claims the use of an additive compound selected from the group consisting of a thermal-absorbent element-included hydroxide (refer to claim 1). Therefore, given that the prior art has clearly indicated that lithium hydroxide can be used as the thin film coating the lithiated (LiMn_2O_4) positive active material, it is asserted that the prior art

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satisfies the requirement of having at least one additive selected from the group consisting of a hydroxide compound.

With respect to the film having materials not including the properties recited in claim 1, it is noted that products of identical chemical composition can not have mutually exclusive properties, and thus, the claimed property of being thermally absorbent, is necessarily present in the prior art material. To be precise, absent further specific chemical composition of hydroxide compounds, it is contended that any hydroxide compound (e.g. lithium hydroxide) exhibits the claimed property.

The assertion that the prior art does not suggest the use of B (at least) as recited in rejected claims 3 and 10 is not sufficient to overcome said rejection. In this regard, it is noted that EXAMPLE 3 shows the use of B_2O_3 and $LiOH \cdot H_2O$ to obtain a fine lithiated powder (EXAMPLE 3 or COL 5, lines 25-45). Accordingly, it is positively contended that a secondary product of said mixture combination of B_2O_3 and $LiOH \cdot H_2O$ can be a hydroxide of boron. Thus, the burden is shifted to the applicant to provide objective evidence demonstrating that no secondary reactions occur as part of the reacting steps being carried out in EXAMPLE 3. Given that the prior art does not specifically point the particular reaction conversion, reactant consumption, the specific product yielding and/or selectivity, the examiner has a reasonable basis to believed that a boron hydroxide is one of the various secondary products forming during the specific compound combination formulated in EXAMPLE 3.

As to the method limitation, i.e. *the additive compound being prepared by the specific drying and temperature treatment (heat treatment)*, it is noted that a method limitation incorporated into a product claim does not patentable distinguish the product because what is

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given patentably consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made. Moreover, Amatucci et al disclose the process of annealing the material at a temperature in the excess of about 400 °C, preferably in the range of about 500-800 °C (COL 2, lines 19-29). Hence, it is contended that at these temperatures, drying of liquid necessarily occurs unless the liquid has an evaporation point higher than 800 °C. In this instance, the claim language is silent as to the specific chemical composition of the liquid subject to the drying step. Thus, it is believed that the annealing step additionally imparts the required dried structure to the liquid being treated by the annealing technique itself.

In response to applicant's argument that “drying results in the removal of liquid, but does not have such physical results as occur in annealing”, the fact that applicant has recognized another advantage/disadvantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., “the degree of uniformity associated to dried products not present in annealed products e.g. internal strains, distortions and imperfections, and clearer-stronger-more uniform material) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

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Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action for claims 36-39. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro
Examiner
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A handwritten signature in black ink, appearing to read 'RAYM', with a long horizontal line extending from the end of the signature.